¥60bn blue LED IP finally realises ¥840m

Worth ¥60bn, paid ¥20,000, re-ordered a payment of ¥20bn, and settled for ¥840m. Shuji Nakamura, inventor of the blue LED, and a professor at UCSB, has reluctantly agreed to ¥840m settlement in the long patent dispute with Nichia Corp.

Nichia Corp agreed to pay some $8m to its former employee as a settlement in a dispute over the blue LED patent, the largest such in Japan for an employee's invention, prompting others to reassess reward systems, according to *Kyodo News*.

Shuji Nakamura (lipiec 1998)

Nichia originally paid Nakamura ¥20,000 for the invention, announced in 1990. The Tokyo High Court mediated the current settlement, after the Tokyo District Court last year ordered the company to pay ¥20bn. The district court ruled the development to be worth about ¥60bn. Nakamura who left Nichia in 1999 was not satisfied with the settlement, but accepted it on the advice of his lawyers. He is quoted as saying " I plan to recommend scientists and engineers go to the US where their abilities are reflected in their income."

Compound aerogels' show promise

Aerogels that can be 'tuned' over a substantial range by adjusting the heating profile, covering the optical spectrum from IR through to UV, have been made from metal chalcogenides of cadmium sulphide, cadmium selenide, zinc sulphide and lead sulphide nanoparticle, instead of metal oxides and carbon.

Researchers at Wayne State University say the combination of high surface area, quantum confinement effects and photoluminescence make metal chalcogenide aerogels attractive candidates for photocatalytic, photovoltaic and sensing applications and believe they will be able to extend the fabrication method to other materials. To prepare the aerogels the nanoparticles were capped with thiolates.

The researchers then oxidised the thiolate capping groups, causing the nanoparticles to form a gel, subsequently dried with supercritical carbon dioxide to maintain pore architecture. Resulting structures contained 2-50nm diameter pores. The materials are reputed to displayed sharp, band-edge photoluminescence at energies significantly blue shifted from 'single crystals.

Post-annealing permits the absorption energy of the materials to be tuned to the red as the framework coarsens and the average crystallite size grows.

Plans are now to generate the materials as thin-films and evaluate their potential for photovoltaic and sensing applications.

Laser materials and systems

Two reports, one from BCC on laser materials and components and the other from *Laser Focus World* offer a prospect of global growth, rationalisation and competition.

Business Communications Co. Inc notes that the materials and components that comprise or are associated with lasers have not been researched in any detail. This highly fragmented and competitive.market is experiencing significant change. Ten years ago there were over 135 laser materials and components suppliers, 70 five years ago, and only about 50 currently and this could shrik though technological innovation means niche player opportunities.

Tthe North American market is put at $1.2bn in 2004, expected to increase at an AAGR of 8.6%, rto $1.8bn in 2009. This includes materials, optical components, equipment, instruments and LED components

Laser materials, (crystals, gases and dyes) used in solid-state lasers, and optical substrates/ coatings, are the basis of optical components. Sales in both are to increase in excess of 7% pa as demand improves. Best prospect is in tunable materials.

Optical components are lenses, mirrors, prisms and beam-splitters, windows, filters, fiber optics, modulators and deflectors). Key elements of laser systems, lenses, mirrors, and filters are the largest product markets in this segment. Sales parallel those of the lasers into which they are incorporated. Stronger medical markets, mean fibre optic waveguides will experience relatively strong growth.

Sales of laser equipment power supplies will be aided by demand for CO_2 lasers in materials and for cooling systems. Instruments (beam analysers, detectors, vibration isolation systems, and positioning equipment) are primarily in R&D, so lag materials processing and other markets. Diode markets, beam analysers expect to provide opportunities.

Diode laser components (drivers and optics) current sales are at $385m, the largest and fastest growing market with an AAGR of 11.8%. The report excludes captive OEM operations for CD & DVD players. Currently the North America market dominates, accounting for 65% of global sales, but China is likely to emerge as a leadi market for lasers. Best prospects will be in Asia/Pacific. Sales are highly dependent on sales of the laser systems, growing replacement and retrofit market.

Thanks to a steady increase in consumer applications involving lasers and optoelectronics, global market for all types of lasers grew 10% in 2004 to reach $5.4bn, says *Laser Focus World* market survey. The global market for all lasers has risen at a CAGR of 18% for the past 10 years expectsto gain another 9% in 2005 to close on $6bn.

" Photonics technologies are moving into the mainstream, beyond printers, pointers, and mice - think cameras, cellphone, flat-panel TVs, car, computers, lighting, chip manufacture, drug discovery, and more," says editor-in- chief, Stephen Anderson.

The largest revenue driver in 2004 was the sales of lasers for semiconductor processing though the18% 2003 gain, fell to just a 4% increase in 2004 to reach $3.20bn, despite double-digit unit growth in a couple of major applications and telecom laser market growing for the first time since 2000. Revenue was impacted by price declines across almost all semiconductor laser categories. For applications of other lasers types (including solid-state, carbon dioxide, ion, and excimer), sales of systems for the medical and materials processing markets moved up.